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Stock market volatility around national elections ☆

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Abstract

This paper investigates a sample of 27 OECD countries to test whether national elections induce higher stock market volatility. It is found that the country-specific component of index return variance can easily double during the week around an election, which shows that investors are surprised by the election outcome. Several factors, such as a narrow margin of victory, lack of compulsory voting laws, change in the political orientation of the government, or the failure to form a government with parliamentary majority significantly contribute to the magnitude of the election shock. Furthermore, some evidence is found that markets with short trading history exhibit stronger reaction. Our findings have important implications for the optimal strategies of institutional and individual investors who have direct or indirect exposure to volatility risk.

JEL classification: G11; G12; G14

Keywords: Political risk; National elections; Stock market volatility

1. Introduction

In his seminal paper Shiller (1981) argues that the observed stock market volatility is inconsistent with the predictions of present value models. The intertemporal variation appears to be inexplicably high and cannot be rationalized even in a model with a stochastic discount factor (Grossman and Shiller, 1981). Although several authors (Flavin, 1983; Kleidon, 1986) questioned the conclusion of excessive volatility on methodological grounds, latter tests accounting for dividend nonstationarity and small sample bias continued to lend support to Shiller's initial claim (see Mankiw et al., 1985, 1991; West, 1988; Zhong et al., 2003; Coakley and Fuertes, 2006). The failure of standard valuation models to explain the magnitude of stock market fluctuations poses a serious challenge to financial economists. Drivers of volatility other than the conventional dividends and earnings need to be identified and evaluated.

Schwert (1989) examines empirically whether the aggregate stock return variability can be linked to macroeconomic variables, financial leverage, and trading volume. His in-depth analysis indicates that only a small proportion of the fluctuations in the market volatility can be explained. The inquiry undertaken in our paper takes a different route and proceeds to show that stock markets can become very unsettled during the periods of important political changes. In particular, we provide evidence that stock market volatility is substantially raised around national elections. Since elections are essentially rare events, our analysis rests on a multi-country approach and the data set constructed for this study covers 27 industrialized nations.

The investigation into return volatility around elections is warranted on at least three grounds. First, the uncertainty about the election outcome has important implications for risk-averse investors. Prior research has

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shown that investors are undiversified internationally and exhibit a significant home bias (French and Poterba, 1991; Baxter and Jermann, 1997). Since they hold predominantly domestic assets, the country-specific political risk will not diffuse in their portfolios. Consequently, the sole event of elections in their home country could have implications for the risk level of their portfolios. Second, any market-wide fluctuations in response to election shocks will augment the systematic volatility of all stocks listed. It is therefore conceivable that option prices could increase around the time when voters cast their ballots. Finally, the results reported here can be of interest to pollsters as they provide indirect evidence on whether the accuracy of pre-election forecasts suffices for practical applications. An observation of volatility hikes around an Election Day would indicate that the efforts to formulate precise predictions should be furthered and additional resources need to be directed towards this end.

2. Methodology

We gauge the impact of elections on the second moment of return distribution using a volatility event-study approach. The analysis starts with isolating the country-specific component of variance within a GARCH(1,1) framework:

$$R_{i,t} = \alpha + \beta R_t^* + \varepsilon_{i,t}, \varepsilon_{i,t} \sim N(0, h_{i,t}), \tag{1}$$

$$h_{i,t} = \gamma_0 + \gamma_1 h_{i,t-1} + \gamma_2 \varepsilon_{i,t-1}^2, \tag{2}$$

where $R_{i,t}$ and R_t^* are the continuously compounded returns on the US dollar denominated stock market index in country i and the global stock market index on day t, respectively. $\varepsilon_{i,t}$ denotes the country-specific part of index returns, and $h_{i,t}$ stands for its conditional variance.

(1) and (2) are estimated jointly using the Maximum Likelihood method over a period immediately preceding the event window. The convention adopted in the literature for the type of event studies described by Brown and Warner (1985) is to use 250 daily returns to estimate the benchmark model. One year of daily observations, however, may be insufficient to accurately model GARCH processes, and a longer estimation window is called for. On the other hand, the use of an over-expansive window will substantially cut the number of elections that can be included in our sample. Guided by these practical considerations and the results of Hwang and Valls Pereira (2006), we have decided to choose an estimation period of 500 trading days.

To measure abnormal volatility, one has to consider the variation in $\varepsilon_{i,t}$ around the event date in relation to its regular non-event level. The GARCH model may serve as a benchmark, as it can provide an indication of what the volatility would have been, had the election not occurred. A word of caution, however, is required. As it stands, (2) is a one-step-ahead forecast and will not generate an event-independent projection. The immediate impact of an election, as measured by $\varepsilon_{i,0}$, will have a bearing on the values of $h_{i,t}$ for any $t > 0$. This issue can be easily resolved by making the volatility forecast conditional only on the information set available prior to the event. For this reason, the volatility benchmark for the k-th day of the event window is defined as a k-step-ahead forecast of the conditional variance based on the information set available on the last day of the estimation window t^*:

$$E[h_{i,t^*+k}|\Omega_{t^*}] = \hat{\gamma}_0 \sum_{j=0}^{k-1} (\hat{\gamma}_1 + \hat{\gamma}_2)^j + (\hat{\gamma}_1 + \hat{\gamma}_2)^{k-1} \hat{\gamma}_1 h_{i,t^*} + (\hat{\gamma}_1 + \hat{\gamma}_2)^{k-1} \hat{\gamma}_2 \hat{\varepsilon}_{i,t^*}^2. \tag{3}$$

The distribution of the residuals during the event window can be described as $\varepsilon_{i,t} \sim N(AR_t,\ M_t \cdot E[h_{i,t}|\Omega_{t^*}])$, where M_t is the multiplicative effect of the event on volatility, AR_t is the event-induced abnormal return, and $t > t^*$. Under the null hypothesis that investors are not surprised by election outcomes, the value of parameter M_t should equal one. Note that, if the residuals were demeaned using the cross-section average, they would be normally distributed with zero mean. Their variance, under the assumption of residual orthogonality, would be

$$var\left(\varepsilon_{i,t} - \frac{1}{N}\sum_{i=1}^{N} \varepsilon_{i,t}\right) = M_t \left[E[h_{i,t}|\Omega_{t^*}] \frac{N-2}{N} + \frac{1}{N^2} \sum_{j=1}^{N} E[h_{j,t}|\Omega_{t^*}]\right] = M_t \cdot EIDRV_{i,t}, \tag{4}$$

where $EIDRV_{i,t}$ stands for the event-independent demeaned residual variance and N is the number of events included in the sample.

Since the objective of the study is to quantify the effect of elections on stock market volatility, M_t is the parameter of primary interest. The method of estimating this event-induced volatility multiple rests on combining residual standardization with a cross-sectional approach in the spirit of Boehmer et al. (1991) and Hilliard and Savickas (2002). Note that the estimate $\widehat{M}_t$ can be calculated as the cross-sectional variance of demeaned residuals, standardized by the event-independent demeaned residual standard deviation $[EIDRV_{i,t}]^{1/2}$:

$$\widehat{M}_t = \frac{1}{N-1} \sum_{i=1}^{N} \times \frac{\left(N \cdot \hat{\varepsilon}_{i,t} - \sum_{j=1}^{N} \hat{\varepsilon}_{j,t}\right)^2}{N \cdot (N-2) \cdot E[h_{i,t}|\Omega_{t^*}] + \sum_{j=1}^{N} E[h_{j,t}|\Omega_{t^*}]}, \tag{5}$$

where $\hat{\varepsilon}_{i,t} = R_{i,t} - (\hat{\alpha} + \hat{\beta} R_t^*)$ and $t > t^*$.

Under the null hypothesis, the demeaned standardized residuals follow a standard normal distribution because M_t equals one. Consequently, the abnormal percentage change in volatility on any day t of the event window is